STCW Table A-III/1 Guidelines for Assessment

Specification of minimum standard of competence

Officers in Charge of an Engineering Watch in a Manned Engine-room or Designated Duty Engineers in a Periodically Unmanned Engine-room

Function: Marine engineering at the operational level

Competence	Knowledge, understanding and proficiency	Performance Condition(s)	Performance Behavior	Performance Criteria
Use appropriate tools for fabrication and repair operations typically performed on ships	Characteristics and limitations of materials used in construction and repair of ships and equipment. Characteristics and limitations of processes used for fabrication and repair. Properties and parameters considered in the fabrication and repair of systems and components. Application of safe working practices in the workshop environment.	In a workshop/laboratory or other safe working environment, given proper tools, lighting, ventilation, and a thin steel plate of no less than 1/4 inch thickness,	NOTE #! the candidate will plan, prepare and safely ~~cut a 3" circular hole in the plate~~ *cut out a circular blank flange with four 7/16" bolt holes 90^{o} apart and corresponding to the dimensions of a two-inch pipe flange* using oxyacetylene process and describe actions as they are being performed.	1. The plan and layout of the job are correct, in proper sequence, and incorporate all safety considerations. 2. All required equipment is set up and the job is properly laid out. 3. The hole is cut according to plan and is within tolerance of +/-1/8 inch. 4. Actions being executed are described correctly as they are being performed. 5. No safety violations are observed.
		In a workshop/laboratory or other safe working environment, given proper tools, lighting, ventilation, and two brass or bronze plates of no less than 1/8 inch thickness,	the candidate will plan, prepare and form **two rectangular pieces of sheet metal."** ~~two plates with a fillet joint design~~ using the brazing process and describe actions as they are being performed. NOTE: WHILE THE SKILL OF BRAZING PLATES IS WORTHY THE USE OF NON-FERROUS MATERIAL IS	1. All required equipment is set up and the job is properly laid out. 2. The candidate selects correct flux material and proper heat. 3. Plates are formed according to plan and the finished joint has no evidence of lack of fill, flux entrapment, non-continuous fillet, base metal

Function: Marine engineering at the operational level

Competence	Knowledge, understanding and proficiency	Performance Condition(s)	Performance Behavior	Performance Criteria
			FERROUS MATERIAL IS NOT PRACTICAL AND WOULD RESULT IN AN UNNECESSARY INCREASE IN EXPENSE TO PERFORM THIS TASK AS PRESENTED. IT IS MORE VALUABLE AND PRAGMATIC TO BRAZE/SWEAT COPPER TUBING JOINTS	erosion, base cracks or other defects. 4. Actions being executed are described correctly as they are being performed. 5. No safety violations are observed.
		In a workshop/laboratory or other safe working environment, given proper tools, lighting, ventilation, and two steel plates of no less than 3/8 inch thickness,	the candidate will plan, prepare and form two steel plates with a T-joint design in a vertical position using an electric arc welding process and describe actions as they are being performed.	1. The plan and layout of the job are correct, in proper sequence, and incorporate all safety considerations. 2. All required equipment is set up and the job is properly laid out. 3. Plates are formed according to plan and the finished joint has no evidence of lack of fill, flux entrapment, non-continuous fillet, base metal erosion, base cracks or other defects. 4. Actions being executed are described correctly as they are being performed. 5. No safety violations are observed.

STCW Table A-III/1 Guidelines for Assessment

Specification of minimum standard of competence

Officers in Charge of an Engineering Watch in a Manned Engine-room or Designated Duty Engineers in a Periodically Unmanned Engine-room

Function: Marine engineering at the operational level

Competence	Knowledge, understanding and proficiency	Performance Condition(s)	Performance Behavior	Performance Criteria
		In a workshop/laboratory or other safe working environment, given proper tools, lighting, ventilation, and ½ inch copper tube and coupling,	the candidate will plan, prepare and make a sweat joint forming the copper tube and coupling and describe actions as they are being performed.	1. The plan and layout of the job are correct, in proper sequence, and incorporate all safety considerations. 2. All required equipment is set up and the job is properly laid out. 3. The tubing is formed according to plan and the finished joint has no evidence of lack of fill, flux entrapment, non-continuous fillet, base metal erosion, base cracks or other defects. 4. Actions being executed are described correctly as they are being performed. 5. No safety violations are observed.
		In a workshop/laboratory or other safe working environment, given ½ inch copper tube of at least 10 inches long, proper tools, and lighting,	the candidate will plan, prepare and form a 90 degree bend on the copper tube using tube bender.	1. The plan and layout of the job are correct, in proper sequence, and incorporate all safety considerations. 2. All required equipment is set up and the job is properly laid out. 3. The copper tube is properly bent (proper angle achieved

Function: Marine engineering at the operational level

Competence	Knowledge, understanding and proficiency	Performance Condition(s)	Performance Behavior	Performance Criteria
				+/- 2 degrees and bend is free of defects and kinks). 4. Actions being executed are described correctly as they are being performed. 5. No safety violations are observed.
		In a workshop/laboratory or other safe working environment, given proper tools and supplies,	the candidate will plan, prepare and conduct a visual test on a welded joint and perform a bend test (or macroscopic, or nick break test techniques) on a welded joint, and report the result of the test.	1. The plan and layout of the job are correct, in proper sequence, and incorporate all safety considerations. 2. All required equipment is set up and the job is properly laid out. 3. The specimen is tested according to plan. 4. Actions being executed are described correctly as they are being performed. 5. The correct test finding is reported. 6. No safety violations are observed.

STCW Table A-III/1 Guidelines for Assessment

Specification of minimum standard of competence

Officers in Charge of an Engineering Watch in a Manned Engine-room or Designated Duty Engineers in a Periodically Unmanned Engine-room

Function: Marine engineering at the operational level

Competence	Knowledge, understanding and proficiency	Performance Condition(s)	Performance Behavior	Performance Criteria
		~~In a workshop/laboratory or other safe working environment, given proper tools and supplies,~~	~~the candidate will plan, prepare and conduct a non-destructive test on a welded joint, a dye-penetrate test on a welded joint, and report the result of tests.~~ conducting a low pressure hydro on a one foot section of 2" pipe each end fitted with welded flanges, using blank flanges to seal the openings. NOTE: The dye penetrate test is overkill. If the candidate is to be a certified welder for pressure vessels, then the higher level of skill would be worthy, otherwise we are requiring a skill level not ordinarily required. Even when welding stock flanges onto a section of pipe, it is more important that the weld(s) not leak and easily tested by setting up a simple hydro on the pipe section.	~~1.The plan and layout of the job are correct, in proper sequence, and incorporate all safety considerations.~~ ~~2.All required equipment is set up and the job is properly laid out.~~ ~~3.The specimen is tested according to plan.~~ ~~4.Actions being executed are described correctly as they are being performed.~~ ~~5.The correct test finding is reported.~~ ~~6.~~1. ~~No safety violations are observe~~d.

STCW Table A-III/1 Guidelines for Assessment

Specification of minimum standard of competence

Officers in Charge of an Engineering Watch in a Manned Engine-room or Designated Duty Engineers in a Periodically Unmanned Engine-room

Function: Marine engineering at the operational level

Competence	Knowledge, understanding and proficiency	Performance Condition(s)	Performance Behavior	Performance Criteria
Use hand tools and measuring equipment for dismantling, maintenance, repair and re-assembly of shipboard plant and equipment	Operational characteristics of equipment and systems.	In a workshop/laboratory or other safe working environment, given a drilling machine, proper tools, lighting, ventilation, and steel stock of no less than 1-inch thickness,	the candidate will plan, prepare and drill a ½ inch diameter blind hole ¾ of an inch deep, perpendicular to the surface using a drilling machine, and describe actions as they are being performed.	1. The plan and layout of the job are correct, in proper sequence, and incorporate all safety considerations. 2. The hole is drilled according to plan, round and within tolerance of +/- 1/64 inch. 3. Actions are described correctly as they are being performed. 4. No safety violations are observed.
		In a workshop/laboratory or other safe working environment, given a drilling machine, proper tools, lighting, ventilation, and steel stock of no less than 1-inch thickness, with a ½ inch diameter blind hole perpendicular to the surface,	The candidate will plan, prepare and thread a blind hole using a set -of *National Course or NATIONAL FINE* hand taps and describe actions as they are being performed.	1. The plan and layout of the job are correct, in proper sequence, and incorporate all safety considerations. 2. The hole is tapped according to plan, is threaded entire depth and holds a bolt perpendicular to the surface. 3. Actions being executed are described correctly as they are being performed. 4. No safety violations are observed.

STCW Table A-III/1 Guidelines for Assessment

Specification of minimum standard of competence

Officers in Charge of an Engineering Watch in a Manned Engine-room or Designated Duty Engineers in a Periodically Unmanned Engine-room

Function: Marine engineering at the operational level

Competence	Knowledge, understanding and proficiency	Performance Condition(s)	Performance Behavior	Performance Criteria
		In a workshop/laboratory or other safe working environment, given a hand die, proper tools, lighting, ventilation, and steel round stock of no less than 3/8 inch diameter,	the candidate will plan, prepare and make an external thread using- a set of *National Course or NATIONAL FINE thread dies …* ~~a hand die~~ and describe actions as they are being performed. NOTE: THERE IS A SPECIFIC DIFFERENCE BETWEEN THE TWO STES OF TAPS AND DIES SITED. EVEN MORE CRITICAL IS TO AVOID THE CANDIDATE FROM USING PIPE THREAD TAPS AND DIES OF WHICH THERE IS AN EVEN GREATER DIFFERENCE HERE THAN WITH THE FORMER TWO.	1. The plan and layout of the job are correct, in proper sequence, and incorporate all safety considerations. 2. The thread is made according to plan and the axes of the thread and stock are co-linear. 3. Actions are described correctly as they are being performed. 4. No safety violations are observed.
Use hand tools, electrical and electronic measuring and test equipment for fault finding, maintenance and repair operations	Construction and operational characteristics of shipboard AC and DC electrical systems and equipment. Construction and operation of electrical test and measuring equipment. Safety requirements for	Given a voltmeter, ammeter, ohmmeter, simple circuit with a power source, and a schematic of the circuit with at least 5 components indicated,	the candidate will outline a plan and use the test equipment to report voltage, amperage and resistance readings related to the components indicated, describing actions as they are being performed.	1. The plan and layout of the job are correct, in proper sequence, and incorporate all safety considerations. 2. The test equipment is properly calibrated. 3. Actions are described correctly as they are being performed. 4. Readings reported are within

STCW Table A-III/1 Guidelines for Assessment

Specification of minimum standard of competence

Officers in Charge of an Engineering Watch in a Manned Engine-room or Designated Duty Engineers in a Periodically Unmanned Engine-room

Function: Marine engineering at the operational level

Competence	Knowledge, understanding and proficiency	Performance Condition(s)	Performance Behavior	Performance Criteria
	working on shipboard electrical systems.			1% of a the assessor's readings. 5. No safety violations are observed.
		Aboard ship or in a workshop, given the schematic of and access to the electrical distribution system, proper tools and safety equipment,	the candidate will find and explain the components, AND the operating characteristics, ~~and perform measurements or troubleshoot a fault of the electrical distribution system.~~ **NOTE: 1) THIS SPECIFIC PERFORMANCE BEHAVIOR IS NOT IN LINE WITH TABLE A-III/1, BUT IS LISTED IN A-III/2.** **2) IT IS ONE THING FOR THE** "candidate to find and explain the components, and the operating characteristics**, BUT BY SPECIFYING THE DISTRIBUTION SYSTEM THIS INDICATES THAT THEY ARE TO CARRY THIS OUT ON THE MAIN**	The candidate will: 1. correctly locate the components; 2. correctly explain the components and their operating characteristics; 3. correctly perform measurements; 4. correctly troubleshoot a fault; and, 5. ensure that no safety violations are observed.

STCW Table A-III/1 Guidelines for Assessment

Specification of minimum standard of competence

Officers in Charge of an Engineering Watch in a Manned Engine-room or Designated Duty Engineers in a Periodically Unmanned Engine-room

Function: Marine engineering at the operational level

Competence	Knowledge, understanding and proficiency	Performance Condition(s)	Performance Behavior	Performance Criteria
			SWITCH BOARD VERSUS A BRANCH, NOT AN INTRINSICALLY SAFE IDEA	
		Aboard ship or in a workshop, given access to an electrical distribution system, and proper tools and safety equipment,	the candidate will plan and carry out a logical procedure to detect the location of grounds, describing actions as they are being performed.	1. The plan and layout of the job are correct, in proper sequence, and incorporate all safety considerations. 2. Actions being executed are described correctly as they are being performed. 3. The logic path followed progressively eliminates or reduces possible grounding sources. 4. Grounding source(s) are correctly identified. 5. No safety violations are observed .
		Aboard ship or in a workshop, given access to 3-phase electrical AC motor and contoller, a Megger test meter, and other proper tools and safety equipment,	the candidate will plan and use the Megger to measure and record the die-electric strength of the insulation resistance of the motor through connections in the controller to measure and record the resistance of the	1. The plan and layout of the job are correct, in proper sequence, and incorporate all safety considerations. 2. Actions being executed are described correctly as they are being performed. 3. The system is confirmed

Function: Marine engineering at the operational level

Competence	Knowledge, understanding and proficiency	Performance Condition(s)	Performance Behavior	Performance Criteria
			motor through connections in the controller, describing actions as they are being performed.	DE-ENERGIZED and the Megger is used correctly in accordance with manufacturer's instructions. 4. The resistance value reported is corrected for temperature and within +/- 5% of the assessor's solution. 5. No safety violations are observed.
		~~Aboard ship or in a workshop, given access to 3-phase electrical AC motor controller, a phase sequence indicator, and other proper tools and safety equipment,~~	~~the candidate will plan and use the phase sequence indicator to determine and report the phase rotation, describing actions as they are being performed.~~ **This may be an interesting experiment to do in an electrical studies lab, BUT rotation of the motor shaft is the more important aspect of the performance outcome and the way this is tested is by starting the motor AND if it is not turning in the proper direction then the observer is switch any two**	~~1.The plan and layout of the job are correct, in proper sequence, and incorporate all safety considerations.~~ ~~2.Actions being executed are described correctly as they are being performed.~~ ~~3.The phase sequence indicator is used correctly and in accordance with manufacturer's instructions.~~ ~~4.The phase rotation reported is correct.~~ ~~5.~~1. ~~No safety violations are observed.~~

Function: Marine engineering at the operational level

Competence	Knowledge, understanding and proficiency	Performance Condition(s)	Performance Behavior	Performance Criteria
			of the three cables.	
Maintain safe engineering watch	Duties associated with taking over and accepting a watch.	Aboard a ship which has main propulsion machinery of 750 kW or more, while underway in an engine room,	the candidate will conduct an inspection of machinery spaces before taking the engine room watch.	1. The status or condition of the main and auxiliary machinery (including fuel, feed water, and exhaust systems), control systems, indicating panels and communication systems are correctly determined, described and reported. 2. The status and condition of the steering system and all associated gear are determined, described, and reported. 3. The condition of the bilges with respect to water level and contamination is determined, described, and reported. 4. No safety violations are observed.
		Aboard ship while underway, or in an approved simulator, given the engineering log book, the pertinent standing orders and proper safety	the candidate will assume the engineering watch in accordance with STCW Code (A-VIII/2 part 3-2), describing each step as	1. All standing orders and special instructions are read and understood and descriptions to the assessor are correct, complete and

Function: Marine engineering at the operational level

Competence	Knowledge, understanding and proficiency	Performance Condition(s)	Performance Behavior	Performance Criteria
		equipment,	executed and making all necessary inspections and site visits required to understand and verify the status of the watch.	indicate clear understanding of duties involved. 2. All work being performed on machinery and systems, personnel involved and potential hazards in the engine room are identified and described to the assessor completely and correctly with watch implications clearly explained. 3. Levels of the following are correctly reported: a. bilges; b. ballast tanks; c. slop tanks; d. reserve feed tanks; e. fresh water tanks, and, f. sewage tanks. 4. The condition and level of fuel are correctly reported for the following: a. reserve tanks; b. settling tanks; c. day tanks; and, d. other fuel storage facilities. 5. Special requirements relating to sanitary system

STCW Table A-III/1 Guidelines for Assessment

Specification of minimum standard of competence

Officers in Charge of an Engineering Watch in a Manned Engine-room or Designated Duty Engineers in a Periodically Unmanned Engine-room

Function: Marine engineering at the operational level

Competence	Knowledge, understanding and proficiency	Performance Condition(s)	Performance Behavior	Performance Criteria
				disposals are verified and correctly reported. 6. The condition and mode of operation of all main, auxiliary, stand-by and emergency equipment are verified and correctly reported. 7. The condition of monitoring and control console equipment, including equipment being operated manually are identified and correctly reported. 8. Where applicable, the condition and mode of operation of the automatic boiler controls such as flame safeguard control systems, limit control systems, combustion control system, fuel supply control systems and other equipment related to the operation of the steam boilers are identified and correctly reported. 9. Potentially adverse conditions resulting from bad weather, ice or

Function: Marine engineering at the operational level

Competence	Knowledge, understanding and proficiency	Performance Condition(s)	Performance Behavior	Performance Criteria
				contaminated or shallow water are verified and appropriate actions are taken. 10. Special modes of operation dictated by equipment failure or adverse ship conditions are verified and reported. 11. The report of the engine room ratings to their assigned duties is verified and reported. 12. Availability of fire fighting appliances is verified and reported. 13. The candidate ensures that the members of the relieving engineering watch are capable of performing their duties effectively.
	Safety precautions to be observed during a watch and immediate actions to be taken in the event of fire or accident, with particular reference to oil system.	Aboard ship or in a suitable engine room simulator, given appropriate alarms, and upon hearing each of the following engine room alarms,	the candidate will name the alarm, acknowledge the alarm, confirm the condition indicated by the alarm and take appropriate action to correct the alarm condition: • Low lubrication oil pressure alarm;	The candidate: 1. correctly identifies each alarm; 2. correctly acknowledges each alarm; 3. correctly confirms each alarm condition; 4. ensures timely action is

Function: Marine engineering at the operational level

Competence	Knowledge, understanding and proficiency	Performance Condition(s)	Performance Behavior	Performance Criteria
			• Low jacket water pressure alarm; • High lubrication oil temperature alarm; • General alarm; and, • Mist detector. NOTE: DEPENDING UPON THE EXTENT OF AUTOMATION THERE MAY BE AS MANY AS 250 INDIVIDUAL ENGINE CONTROL/SYSTEM ALARMS. THE ANNUNCIATOR BEING THE SAME FOR ALL 250. THE GENERAL ALARM AND FIXED FIRE EXTINGUISHING SYSTEM ALARM ARE TYPICALLY INDIVIDUAL, SEPARATE AND DISTINCTIVELY DIFFERENT SOUNDS	taken to correct each indicated alarm condition; 5. clears an alarm when corrective actions have been taken; and, 6. ensures that no safety or environmental violations occur.
Use English in written and oral form	Adequate knowledge of the English language to enable the officer to use engineering publications and to perform engineering duties.	Non-standard Note: The reading comprehension requirement is considered to have been met when the candidate passes an orally unassisted written U.S. Coast Guard examination for the		

STCW Table A-III/1 Guidelines for Assessment

Specification of minimum standard of competence

Officers in Charge of an Engineering Watch in a Manned Engine-room or Designated Duty Engineers in a Periodically Unmanned Engine-room

Function: Marine engineering at the operational level

Competence	Knowledge, understanding and proficiency	Performance Condition(s)	Performance Behavior	Performance Criteria
		license for which the endorsement is sought. If this qualification is not met, the alternative method listed below may be used at the discretion of the assessor.		
		Alternative Method of Demonstrating Competency: In a suitable classroom or other testing environment and given any approved, commercially available and recognized English language reading comprehension test instrument,	the candidate will complete the reading comprehension test instrument in accordance with the instructions and conditions specified in the test instrument instructions.	The candidate achieves the minimum score specified in the approval for the test instrument administered.
		Non-standard Note: The listening component of the oral comprehension requirement is considered to have been met when the candidate complies with the instructions and directions of the assessor during the assessment process for this table administered in English. If this qualification is not met, the alternative method listed		

Function: Marine engineering at the operational level

Competence	Knowledge, understanding and proficiency	Performance Condition(s)	Performance Behavior	Performance Criteria
		below may be used at the discretion of either assessor or the candidate.		
		Alternative Method of Demonstrating Competency: In a suitable classroom or other testing environment and given any approved, commercially available and recognized English language listening comprehension test instrument,	the candidate will complete the listening comprehension test instrument bank in accordance with the instructions and conditions specified in the test instrument instructions.	The candidate achieves the minimum score specified in the approval for the test instrument administered.
		Non-standard Note: The speaking skills component of the oral comprehension requirement is considered to have been met when the candidate successfully completes an assessor checklist requirement in each demonstration to correctly describe actions as they are being performed or demonstrated in English. If this qualification is not met, the alternative method listed below may be used at the discretion of either assessor		

Function: Marine engineering at the operational level

Competence	Knowledge, understanding and proficiency	Performance Condition(s)	Performance Behavior	Performance Criteria
		or the candidate.		
		Alternative Method of Demonstrating Competency: In a suitable classroom or other testing environment and given any approved, commercially available and recognized English language speaking skills test instrument,	the candidate will complete the reading comprehension test instrument bank in accordance with the instructions and conditions specified in the test instrument instructions.	The candidate achieves the minimum score specified in the approval for the test instrument administered.
Operate main and auxiliary machinery and associated control systems	Preparation of main machinery and of auxiliary machinery for operation.	~~Aboard ship in port at the steering room station or in an approved simulator,~~ 1) EVERY candidate for OICEW needs to be given all aspects of knowledge training regarding the steering gear. 2) During their time aboard ship they should be available to accompany the engineer who will "test" the steering gear to understand what is being done. 3) HOWEVER, with the exception of a few diesel vessels, the steering gear flat is located away from the	~~the candidate will plan, describe and conduct an operational steering gear test, describing actions as they are being performed.~~ 5) Table A-III/1 in no way identifies the steering gear as an assessment of practical skill. 6) A stronger case can be made for Second Engineer (STCW) through Table A-III/2 to "test" the steering gear. 7) Bottom line is that this is	~~1.The plan reflects proper sequence of actions, is complete, and conforms to the requirements of regulations, manufacturer's instructions and ship's procedures.~~ ~~2.The operational steering gear test is conducted according to plan and all reports of observations and tests are accurate and complete.~~ ~~3.Actions taken are correctly and completely described.~~ ~~4.Required steps taken are verified by assessor utilizing a sample checklist as a~~

Function: Marine engineering at the operational level

Competence	Knowledge, understanding and proficiency	Performance Condition(s)	Performance Behavior	Performance Criteria
		engine room, and on steam ships this is even more pronounced. 4) At the time of testing gear, steam will have already been applied to the main engine and therefore the job of the OICEW is to be on watch in the engine room while steam is on the engine.	not a skill practical demonstration required of an OICEW and should not be included here or in the final publication of the assessment criteria.	~~guide.~~ ~~5.No safety violations are observed.~~
		Aboard ship or using an approved simulator, and given access to a refrigeration system that has been secured,	~~the candidate will plan for and start up a refrigeration system, describing actions as they are being performed.~~ While this task should be done, it was agreed upon at the September 1999, MERPAC working group that these were not to be assessed tasks of proficiency as these tasks are not the normal duties of the watch, BUT are left to the First A/E and Chief	1. The plan reflects proper sequence of actions, is complete, and conforms to the requirements of manufacturer's instructions and ship's procedures. 2. Start up of the refrigeration system is successful and conducted according to plan. 3. Actions taken are correctly and completely described. 4. Required steps taken are verified by assessor utilizing a sample checklist as a

Function: Marine engineering at the operational level

Competence	Knowledge, understanding and proficiency	Performance Condition(s)	Performance Behavior	Performance Criteria
				guide. 5. No safety violations are observed.
		Aboard ship or using an approved simulator, and given access to an operating refrigeration system,	~~the candidate will plan for and shut down a refrigeration system, describing actions as they are being performed.~~ While this task should be done as part of training, it was agreed upon at the September 1999, MERPAC working group that these were not to be assessed tasks of proficiency as these tasks are not the normal duties of the watch, BUT are left to the First A/E and Chief	1. The plan reflects proper sequence of actions, is complete, and conforms to the requirements of manufacturer's instructions and ship's procedures. 2. Shut down of the refrigeration system is successful and conducted according to plan. 3. Actions taken are correctly and completely described. 4. Required steps taken are verified by assessor utilizing a sample checklist as a guide. 5. No safety violations are observed.
		Aboard ship or using an approved simulator, and given access to an air compressor,	the candidate will plan for securing the on-line low pressure ship's service air compressor and start up and place on line the stand-by unit,….~~start up the compressor,~~ describing actions as they are being	1. The plan reflects proper sequence of actions, is complete, and conforms to the requirements of manufacturer's instructions and ship's procedures. 2. Start up of the compressor is successful and conducted

Function: Marine engineering at the operational level

Competence	Knowledge, understanding and proficiency	Performance Condition(s)	Performance Behavior	Performance Criteria
			performed.	according to plan. 3. Actions taken are correctly and completely described. 4. Required steps taken are verified by assessor utilizing a sample checklist as a guide. 5. No safety violations are observed.
		Aboard ship or using an approved simulator, and given access to an air compressor,	~~the candidate will plan for and shut down the compressor, describing actions as they are being performed.~~ NOTE: This should be part of the watch standing routine and not presented as a separate function. Also the securing of one unit and the starting of the stand-by unit go hand in hand	1. The plan reflects proper sequence of actions, is complete, and conforms to the requirements of manufacturer's instructions and ship's procedures. 2. Shut down of the compressor is successful and conducted according to plan. 3. Actions taken are correctly and completely described. 4. Required steps taken are verified by assessor utilizing a sample checklist as a guide. 5. No safety violations are observed.

STCW Table A-III/1 Guidelines for Assessment

Specification of minimum standard of competence

Officers in Charge of an Engineering Watch in a Manned Engine-room or Designated Duty Engineers in a Periodically Unmanned Engine-room

Function: Marine engineering at the operational level

Competence	Knowledge, understanding and proficiency	Performance Condition(s)	Performance Behavior	Performance Criteria
		Aboard ship or using an approved simulator, and given access to a fresh water generator,	the candidate will plan for and start up the fresh water generator, describing actions as they are being performed.	1. The plan reflects proper sequence of actions, is complete, and conforms to the requirements of manufacturer's instructions and ship's procedures. 2. Start up of the fresh water generator is successful and conducted according to plan. 3. Fresh water is generated and water salinity is under 4.24 ppm. 4. Actions taken are correctly and completely described. 5. Required steps taken are verified by assessor utilizing a sample checklist as a guide. 6. No safety violations are observed.
		Aboard ship or using an approved simulator, and given access to a fresh water generator,	the candidate will plan for and shut down the fresh water generator, describing actions as they are being performed.	1. The plan reflects proper sequence of actions, is complete, and conforms to the requirements of manufacturer's instructions and ship's procedures. 2. Shut down of the fresh water generator is successful and conducted according to plan.

STCW Table A-III/1 Guidelines for Assessment

Specification of minimum standard of competence

Officers in Charge of an Engineering Watch in a Manned Engine-room or Designated Duty Engineers in a Periodically Unmanned Engine-room

Function: Marine engineering at the operational level

Competence	Knowledge, understanding and proficiency	Performance Condition(s)	Performance Behavior	Performance Criteria
				3. Actions taken are correctly and completely described. 4. Required steps taken are verified by assessor utilizing a sample checklist as a guide. 5. No safety violations are observed.
		Aboard ship or using an approved simulator, and given access to a fuel oil or lube oil purifier,	the candidate will plan for and start the lube oil purifier, describing actions as they are being performed. NOTE: NEED TO DEVELOP SIMILAR ASSESSMENT CRITERIA FOR SELF-CLEANING HEAVY FUEL OIL CENTRIFUGES. WHILE THERE ARE SIMILARITYIES IN PRINCIPLES OF OPERATION THEY ARE TYPICALLY MORE SOPHISTICATED IN COMPONENT DESIGN AND COMPUTER CONTROLLED.	1. The plan reflects proper sequence of actions, is complete, and conforms to the requirements of manufacturer's instructions and ship's procedures. 2. Start up of the purifier is successful and conducted according to plan. 3. Actions taken are correctly and completely described. 4. Required steps taken are verified by assessor utilizing a sample checklist as a guide. 5. No safety violations are observed.
		Aboard ship or using an approved simulator, and given access to a running fuel	the candidate will plan for and secure the lube oil purifier for cleaning,	1. The plan reflects proper sequence of actions, is complete, and conforms to

Function: Marine engineering at the operational level

Competence	Knowledge, understanding and proficiency	Performance Condition(s)	Performance Behavior	Performance Criteria
		oil or lube oil purifier,	describing actions as they are being performed. NOTE: NEED TO DEVELOP SIMILAR ASSESSMENT CRITERIA FOR SELF-CLEANING HEAVY FUEL OIL CENTRIFUGES. WHILE THERE ARE SIMILARITYIES IN PRINCIPLES OF OPERATION THEY ARE TYPICALLY MORE SOPHISTICATED IN COMPONENT DESIGN AND COMPUTER CONTROLLED.	the requirements of manufacturer's instructions and ship's procedures. 2. Securing of the purifier is successful and conducted according to plan. 3. Actions taken are correctly and completely described. 4. Required steps taken are verified by assessor utilizing a sample checklist as a guide. 5. No safety violations are observed.
		Aboard a ship in port or at anchor, or in an approved simulator, and given access to a main propulsion diesel engine,	the candidate will plan for and *assist in preparing* ~~prepare~~ a main propulsion diesel engine for operation, describing actions as they are being performed. NOTE: Table A-III/1 does not call for the OICEW to be able to prepare the engine on their own	1. The plan reflects proper sequence of actions, is complete, and conforms to the requirements of manufacturer's instructions and ship's procedures. 2. Preparation of the main propulsion diesel engine for operation is successful and conducted according to plan*. 3. Actions taken are correctly and completely described. 4. Required steps taken are

Function: Marine engineering at the operational level

Competence	Knowledge, understanding and proficiency	Performance Condition(s)	Performance Behavior	Performance Criteria
				verified by assessor utilizing a sample checklist as a guide. 5. No safety violations are observed. * (Note: Because of the physical separations and complexity of the tasks involved in demonstration of this proficiency, the assessment may be accomplished in segments during successive operational opportunities aboard ship.)
		Aboard a ship in port or at anchor, or in an approved simulator, and given access a main propulsion diesel engine,	the candidate will plan for and assist in securing ~~secure~~ a main propulsion diesel engine, describing actions as they are being performed. NOTE: Table A-III/1 does not call for the OICEW to be able to secure the engine on their own	1. The plan reflects proper sequence of actions, is complete, and conforms to the requirements of manufacturer's instructions and ship's procedures. 2. Securing of the main propulsion diesel engine is successful and conducted according to plan*. 3. Actions taken are correctly and completely described. 4. Required steps taken are verified by assessor utilizing a sample checklist as a

Function: Marine engineering at the operational level

Competence	Knowledge, understanding and proficiency	Performance Condition(s)	Performance Behavior	Performance Criteria
				guide. 5. No safety violations are observed. * (Note: Because of the physical separations and complexity of the tasks involved in demonstration of this proficiency, the assessment may be accomplished in segments during successive operational opportunities aboard ship.)
		Aboard a ship in port or at anchor, or in an approved simulator, and given access to a main steam turbine,	the candidate will plan for and assist in preparing ~~prepare~~ a main steam turbine for operation, describing actions as they are being performed. NOTE: Table A-III/1 does not call for the OICEW to be able to prepare the main steam turbine on their own	1. The plan reflects proper sequence of actions, is complete, and conforms to the requirements of manufacturer's instructions and ship's procedures. 2. Preparation of the main steam turbine for operation is successful and conducted according to plan*. 3. Actions taken are correctly and completely described. 4. Required steps taken are verified by assessor utilizing a sample checklist as a guide. 5. No safety violations are

STCW Table A-III/1 Guidelines for Assessment

Specification of minimum standard of competence

Officers in Charge of an Engineering Watch in a Manned Engine-room or Designated Duty Engineers in a Periodically Unmanned Engine-room

Function: Marine engineering at the operational level

Competence	Knowledge, understanding and proficiency	Performance Condition(s)	Performance Behavior	Performance Criteria
				observed. * (Note: Because of the physical separations and complexity of the tasks involved in demonstration of this proficiency, the assessment may be accomplished in segments during successive operational opportunities aboard ship.)
		Aboard a ship at sea or in an approved simulator, given access to a main steam turbine,	the candidate will plan for and monitor an operating main steam turbine, describing actions as they are being performed.	1. The plan reflects proper sequence of actions, is complete, and conforms to the requirements of manufacturer's instructions and ship's procedures. 2. The main steam turbine is successfully monitored according to plan*. 3. Actions taken are correctly and completely described. 4. Required steps taken are verified by assessor utilizing a sample checklist as a guide. 5. No safety violations are observed. * (Note: Because of the physical

Function: Marine engineering at the operational level

Competence	Knowledge, understanding and proficiency	Performance Condition(s)	Performance Behavior	Performance Criteria
				separations and complexity of the tasks involved in demonstration of this proficiency, the assessment may be accomplished in segments during successive operational opportunities aboard ship.)
		Aboard a ship in port or at anchor, or in an approved simulator, and given access to a main steam turbine,	the candidate will plan for and assist in securing ~~secure~~ a main steam turbine, describing actions as they are being performed. NOTE: Table A-III/1 does not call for the OICEW to be able to securing the main steam turbine on their own	1. The plan reflects proper sequence of actions, is complete, and conforms to the requirements of manufacturer's instructions and ship's procedures. 2. The main steam turbine is successfully secured and conducted according to plan*. 3. Actions taken are correctly and completely described. 4. Required steps taken are verified by assessor utilizing a sample checklist as a guide. 5. No safety violations are observed. * (Note: Because of the physical separations and complexity of the tasks involved in

STCW Table A-III/1 Guidelines for Assessment

Specification of minimum standard of competence

Officers in Charge of an Engineering Watch in a Manned Engine-room or Designated Duty Engineers in a Periodically Unmanned Engine-room

Function: Marine engineering at the operational level

Competence	Knowledge, understanding and proficiency	Performance Condition(s)	Performance Behavior	Performance Criteria
				demonstration of this proficiency, the assessment may be accomplished in segments during successive operational opportunities aboard ship.)
	Operation of steam boilers, including combustion system.	Aboard a ship in port or at anchor, or in an approved simulator, and given access to a main boiler,	the candidate will plan for and demonstrate the duties involved in "lighting off" a main boiler, describing actions as they are being performed.	1. The plan reflects proper sequence of actions, is complete, and conforms to the requirements of manufacturer's instructions and ship's procedures. 2. The "lighting off" of the main boiler is successful and conducted according to plan*. 3. Actions taken are correctly and completely described. 4. Required steps taken are verified by assessor utilizing a sample checklist as a guide. 5. No safety violations are observed. * (Note: Because of the physical separations and complexity of the tasks involved in demonstration of this proficiency, the assessment may

STCW Table A-III/1 Guidelines for Assessment

Specification of minimum standard of competence

Officers in Charge of an Engineering Watch in a Manned Engine-room or Designated Duty Engineers in a Periodically Unmanned Engine-room

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Competence	Knowledge, understanding and proficiency	Performance Condition(s)	Performance Behavior	Performance Criteria
				be accomplished in segments during successive operational opportunities aboard ship.)
		Aboard a ship in port or at anchor, or in an approved simulator, and given access to a main boiler,	the candidate will plan for and secure a main boiler, describing actions as they are being performed.	1. The plan reflects proper sequence of actions, is complete, and conforms to the requirements of manufacturer's instructions and ship's procedures. 2. Securing of the boiler is successful and conducted according to plan*. 3. Actions taken are correctly and completely described. 4. Required steps taken are verified by assessor utilizing a sample checklist as a guide. 5. No safety violations are observed. * (Note: Because of the physical separations and complexity of the tasks involved in demonstration of this proficiency, the assessment may be accomplished in segments during successive operational opportunities aboard ship.)

STCW Table A-III/1 Guidelines for Assessment

Specification of minimum standard of competence

Officers in Charge of an Engineering Watch in a Manned Engine-room or Designated Duty Engineers in a Periodically Unmanned Engine-room

Function: Marine engineering at the operational level

Competence	Knowledge, understanding and proficiency	Performance Condition(s)	Performance Behavior	Performance Criteria
		Aboard a ship in port or at anchor, or in an approved simulator, and given access to a main boiler,	the candidate will perform a bottom blow of a boiler.	1. Operations are planned and carried out in accordance with manufacturer's instructions and ship's procedures to ensure safety of operations and avoid pollution of the environment. 2. The task is correctly completed and described. 3. No safety violations are observed.
		Aboard a ship in port or at anchor, or in an approved simulator, and given access to a main boiler,	the candidate will test the boiler water for the following: • ~~phenolphthalein alkalinity~~; • total alkalinity; • chloride; • phosphate; • ~~hardness;~~ ~~? pH value;~~ • dissolved oxygen; • total dissolved solids; and, • ~~hydrazine~~ • NOTE: 1) If total alkalinity test is performed the indicated PHENOLPHTHALEIN	The candidate: 1. correctly explains the reason and importance for testing; 2. correctly identifies the source, amount, and temperature of the sample; 3. correctly identifies the chemicals and amount; 4. correctly performs the test procedure and records the results; 5. correctly identifies corrective actions associated with the results if applicable; and, 6. ensures no safety violations are observed.

Function: Marine engineering at the operational level

Competence	Knowledge, understanding and proficiency	Performance Condition(s)	Performance Behavior	Performance Criteria
			PHENOLPHTHALEIN and pH value are redundant. • 2) Hardness test was eliminated more than 30 years ago, even when the USCG was requiring candidates to perform boiler water tests before an inspector. • 3) Hydrazene, a known carcinogen, was added to the condensate as an oxygen scavenger. It was prohibited from use in the 80's as some steam ships using the main condensate for evaporator distilling condenser cooling ended up leaking into the potable distilled tanks and as cases of cancer increased during its 15 year use was eventually banned.	

STCW Table A-III/1 Guidelines for Assessment

Specification of minimum standard of competence

Officers in Charge of an Engineering Watch in a Manned Engine-room or Designated Duty Engineers in a Periodically Unmanned Engine-room

Function: Marine engineering at the operational level

Competence	Knowledge, understanding and proficiency	Performance Condition(s)	Performance Behavior	Performance Criteria
	Methods of checking water level in steam boilers and necessary action to be taken if water level is abnormal.	Aboard a ship in port or at anchor, or in an approved simulator, and given access to a main or auxiliary boiler,	~~the candidate will check and report the boiler water level, describing actions as they are being performed.~~ This an important part of the watch routine, however, taking this as a singular assessment is counterproductive to ALL of the individual tasks necessary for determining the proficiency of the candidate	1. The reported reading is +/- 1 inch of and conducted according to plan. 2. Actions taken are correctly and completely described. 3. No safety violations are observed.
		Aboard a ship in port or at anchor, or in an approved simulator, and given access to a main or auxiliary boiler,	~~the candidate will plan for and respond to a boiler high water alarm, describing actions as they are being performed.~~ With the exception of the simulator at Cal Maritime, other PC simulation programs are not effective in mimicking a High Water casualty (unable to replicate use of main and auxiliary feed system surface or bottom blow necessary to reduce	1. The plan reflects proper sequence of actions, is complete, and conforms to the requirements of manufacturer's instructions and ship's procedures. 2. The response to the high water alarm is timely, effective and conducted according to plan. 3. Actions taken are correctly and completely described. 4. Required steps taken are verified by assessor utilizing

STCW Table A-III/1 Guidelines for Assessment
Specification of minimum standard of competence
Officers in Charge of an Engineering Watch in a Manned Engine-room or Designated Duty Engineers in a Periodically Unmanned Engine-room

Function: Marine engineering at the operational level

Competence	Knowledge, understanding and proficiency	Performance Condition(s)	Performance Behavior	Performance Criteria
			water level). To expect this task to be assessed onboard a ship would go against the grain of the caution in STCW, Section A-I/6-2 "…training and assessment will not adversely affect the normal operation of the ship…. and this is an abnormal condition that could be catastrophic."	a sample checklist as a guide. 5. No safety violations are observed.
		Aboard a ship in port or at anchor, or in an approved simulator, and given access to a main or auxiliary boiler,	the candidate will plan for and respond to a boiler low water alarm, describing actions as they are being performed. With the exception of the simulator at Cal Maritime, other PC simulation programs are not effective in mimicking a Low Water casualty (unable to replicate use of auxiliary feed system). To expect this task to be assessed onboard a ship would go against the grain of the caution in STCW, Section A-I/6-2 "…training and assessment will not adversely affect the normal	1. The plan reflects proper sequence of actions, is complete, and conforms to the requirements of manufacturer's instructions and ship's procedures. 2. Response to the low water alarm is timely, effective and conducted according to plan. 3. Actions taken are correctly and completely described. 4. Required steps taken are verified by assessor utilizing a sample checklist as a guide. 5. No safety violations are observed.

STCW Table A-III/1 Guidelines for Assessment

Specification of minimum standard of competence

Officers in Charge of an Engineering Watch in a Manned Engine-room or Designated Duty Engineers in a Periodically Unmanned Engine-room

Function: Marine engineering at the operational level

Competence	Knowledge, understanding and proficiency	Performance Condition(s)	Performance Behavior	Performance Criteria
			operation of the ship…. And this is an abnormal condition that could be catastrophic."	
Operate pumping systems and associated control systems	Routine pumping operations.	Aboard a ship in port or at anchor, or in an approved simulator, and given proper fuel oil transfer procedures and equipment,	the candidate will plan for and conduct an onboard fuel transfer, describing actions as they are being performed.	1. The plan reflects proper sequence of actions, is complete, and conforms to ship's procedures. 2. The fuel transfer is conducted according to plan. 3. Actions taken are correctly and completely described. 4. Required steps taken are verified by assessor utilizing a sample checklist as a guide. 5. No safety or pollution violations are observed.
		Aboard ship in port or at anchor, or in an approved simulator, and given a piping diagram for the vessel and ballast pumping procedures,	the candidate will plan for and conduct a ballasting operation **of FUEL OIL DOBLE BOTTOM OR FUEL OIL WING TANKS,**, describing actions as they are being performed.	1. The plan reflects proper sequence of actions, is complete, and conforms to ship's procedures. 2. The ballasting is conducted according to plan. 3. Actions taken are correctly and completely described. 4. Required steps taken are verified by assessor utilizing a sample checklist as a guide.

STCW Table A-III/1 Guidelines for Assessment

Specification of minimum standard of competence

Officers in Charge of an Engineering Watch in a Manned Engine-room or Designated Duty Engineers in a Periodically Unmanned Engine-room

Function: Marine engineering at the operational level

Competence	Knowledge, understanding and proficiency	Performance Condition(s)	Performance Behavior	Performance Criteria
				5. No safety or pollution violations are observed.
		Aboard a ship underway or in an approved simulator, and given the piping diagram for the vessel and ballast pumping procedures,	the candidate will plan for and conduct a deballasting operation of FUEL OIL DOBLE BOTTOM OR FUEL OIL WING TANKS, describing actions as they are being performed.	1. The plan reflects proper sequence of actions, is complete, and conforms to ship's procedures. 2. The deballasting is conducted according to plan. 3. Actions taken are correctly and completely described. 4. Required steps taken are verified by assessor utilizing a sample checklist as a guide. 5. No safety or pollution violations are observed.
	Operation of bilge, ballast and cargo pumping systems.	Aboard ship in port, at anchor or while underway, or in an approved simulator, and given the engineering log book, the pertinent standing orders, the oil record book, and proper safety equipment,	the candidate will plan for and pump out the engine room bilge wells describing actions as they are being performed.	1. The plan reflects proper sequence of actions, is complete, and conforms to the requirements of ship's procedures. 2. The engine room wells are pumped according to plan. 3. Actions taken are correctly and completely described. 4. Required steps taken are verified by assessor utilizing a sample checklist as a

Function: Marine engineering at the operational level

Competence	Knowledge, understanding and proficiency	Performance Condition(s)	Performance Behavior	Performance Criteria
				guide. 5. No safety or pollution violations are observed.
		Aboard a ship in port, at anchor or while underway, or in an approved simulator, and given the engineering log book, the pertinent standing orders, the oil record book, and proper safety equipment,	the candidate will plan for and pump out a cargo hold or the shaft alley bilge wells.	1. The plan reflects proper sequence of actions, is complete, and conforms to the requirements of ship's procedures. 2. The cargo hold or shaft alley bilge wells are pumped according to plan. 3. Actions taken are correctly and completely described. 4. Required steps taken are verified by assessor utilizing a sample checklist as a guide. 5. No safety or pollution violations are observed.